



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent 1000-D3  
UNIQUE ID NUMBER: 02P23RR128  
COMBUSTOR: Phase5 Tiled  
ENGINE TYPE: TF

BYPASS RATIO: 9.0  
PRESSURE RATIO ( $\pi_{co}$ ): 46.0  
RATED THRUST ( $F_{oo}$ ) (kN): 334.7

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
D <sub>p</sub> /F <sub>oo</sub> (g/kN) or SN	0.0	9.0	68.2	16.4
AS % OF ORIGINAL LIMIT	0.0	7.6	51.6	96.4
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			64.6	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			68.9	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			74.9	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			83.0	

For non-volatile particulate matter (nvPM) emissions, please refer to the ICAO Engine nvPM Emissions Data Sheet.

### DATA STATUS

- PRE-REGULATION  
x CERTIFICATION  
- REVISED (SEE REMARKS)

### TEST ENGINE STATUS

- NEWLY MANUFACTURED ENGINES  
x DEDICATED ENGINES TO PRODUCTION STANDARD  
- OTHER (SEE REMARKS)

### EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE  
(ANNEX 16 VOLUME II)

### CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)

- OUT OF PRODUCTION (DATE: - )  
- OUT OF SERVICE (DATE: - )

### MEASURED DATA

MODE	POWER SETTING (%F <sub>oo</sub> )	TIME (minutes)	FUEL FLOW (kg/s)	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NO <sub>x</sub>	
TAKE-OFF	100	0.7	2.556	0.00	0.42	55.28	8.2
CLIMB OUT	85	2.2	2.090	0.00	0.42	41.46	11.4
APPROACH	30	4.0	0.687	0.00	0.61	14.26	9.3
IDLE	7	26.0	0.256	0.00	6.51	5.79	1.9
LTO TOTAL FUEL (kg) or EMISSIONS (g)			947	0	2860	22034	-
NUMBER OF ENGINES				8	8	8	8
NUMBER OF TESTS				18	18	18	18
AVERAGE D <sub>p</sub> /F <sub>oo</sub> (g/kN) or AVERAGE SN (MAX)				0.0	8.5	65.8	14.7
SIGMA (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)				0.0	1.7	0.8	2.0
RANGE (D <sub>p</sub> /F <sub>oo</sub> in g/kN, or SN)				0.0	5.47-10.65	64.73-66.95	11.4-16.7

### ACCESSORY LOADS

POWER EXTRACTION 0 (kW)  
STAGE BLEED 0 (% CORE FLOW)

AT - POWER SETTINGS  
AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	98.9-102.1
TEMPERATURE (K)	280.4-303.5
ABS HUMIDITY (kg/kg)	0.00308-0.01917

### FUEL

SPEC	
H/C	1.92
AROM (%)	16.89

MANUFACTURER: Rolls-Royce plc  
TEST ORGANIZATION: Rolls-Royce plc  
TEST LOCATION: Derby  
TEST DATES: 24/09/2009-28/08/2019

### NO<sub>x</sub> REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
x	2.3.2 e) (CAEP/8)

### REMARKS

- Representative of Trent 1000-TEN engines
- EDNS01000935986

Compliance with Fuel Venting requirements:

x ('x' if complies, 'PR' if pre-regulation, '- ' if information is not available)